



مركز أم الإمارات

Electric potential Review

Grade 12A / Ministry of education syllabus

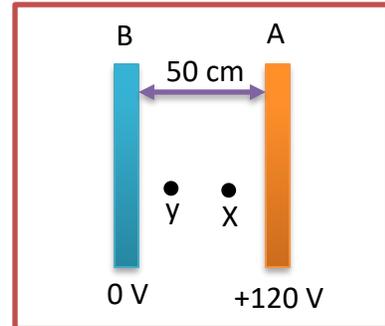
The academic year 2020-2021

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Chose the correct answer for each of the following questions.

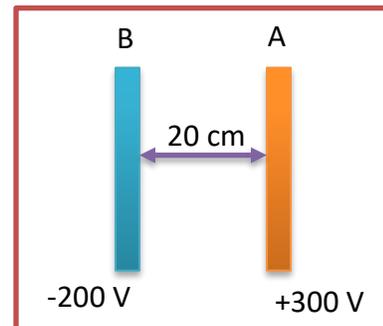
- 1- Two plates (A,B) shown in the figure, separated by 50 cm distance, what is the electric potential difference between the two points (x, y) if they are 30 cm apart ?

- A. 72 V
- B. 89 V
- C. 120 V
- D. 135 V



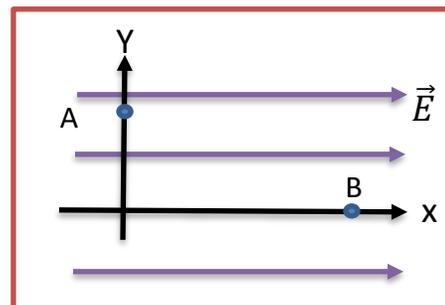
- 2- Two plates (A,B) shown in the figure, separated by 20 cm distance, an electron released from rest 5 cm from plate A, what is the speed of the electron when it reaches plate A?

- A. 6.6×10^6 m/s
- B. 3.4×10^6 m/s
- C. 2.9×10^6 m/s
- D. 1.5×10^6 m/s



- 3- Rely on the figure and find the change in electric potential energy of a proton moves in a uniform electric field of 3000 V/m strength from point A (0,3) cm to point B (6,0) cm?

- A. $+2.9 \times 10^{-17}$ J
- B. -1.3×10^{-17} J
- C. $+1.3 \times 10^{-17}$ J
- D. -2.9×10^{-17} J



4- An infinite conducting plate in the x-z plane has a uniform charge distribution of $-13\mu\text{C}/\text{cm}^2$, what is the work done by the electric field on $-3.0\mu\text{C}$ charged object to move from point A ($y_A=3.0\text{ cm}$) to point B ($y_B=6.0\text{ cm}$) on y-axis?

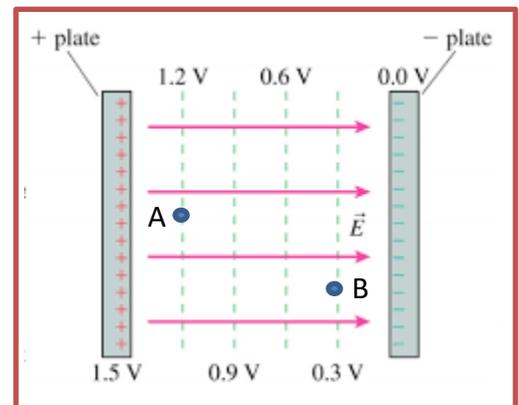
- A. $+4.2 \times 10^3\text{ J}$
- B. $-1.3 \times 10^3\text{ J}$
- C. $+1.3 \times 10^3\text{ J}$
- D. $-4.2 \times 10^3\text{ J}$

5- What is the work done by uniform electric field of 5000 V/m strength, to move a dipole of $5.0 \times 10^{-6}\text{ C.m}$ moment, from $\theta=90^\circ$ to $\theta=40^\circ$?

- A. $1.9 \times 10^{-2}\text{ J}$
- B. $3.6 \times 10^{-2}\text{ J}$
- C. $4.1 \times 10^{-2}\text{ J}$
- D. $5.3 \times 10^{-2}\text{ J}$

6- What is the work done by uniform electric field on a proton to move from point A to point B as shown in the figure?

- A. $1.4 \times 10^{-19}\text{ J}$
- B. $2.5 \times 10^{-19}\text{ J}$
- C. $3.1 \times 10^{-19}\text{ J}$
- D. $4.2 \times 10^{-19}\text{ J}$



7- What is the initial acceleration of a particle with a charge of $1.0\mu\text{C}$ and mass of 2.0 mg , after it touches a point at position $x=2.0\text{ m}$ in a region where the electric potential varies according to $(V(x) = -3x^2 + 2x)\text{ Volt}$

- A. 3.2 m/s^2
- B. 4.4 m/s^2
- C. 5.0 m/s^2
- D. 6.2 m/s^2

8- Which of the following is one of the lithium- ion battery's disadvantages?

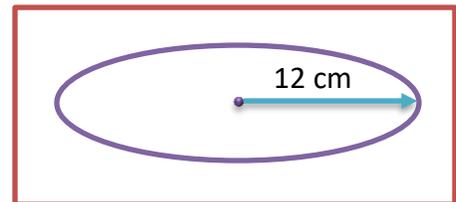
- A. It can no longer recharged, if it is completely discharge.
- B. It has much lower energy density than conventional batteries.
- C. I can recharge one hundred times.
- D. It has a memory effect.

9- A positive charge of $4.5 \mu\text{C}$ is fixed in place. A particle of mass 6.0 g and charge $+3.0 \mu\text{C}$ is fired with an initial speed of 66 m/s directly toward the fixed charge from 4.2 cm away. How close does the moving charge get to the fixed charge before it comes to rest?

- A. 2.4 cm
- B. 1.8 cm
- C. 0.92 cm
- D. 0.76 cm

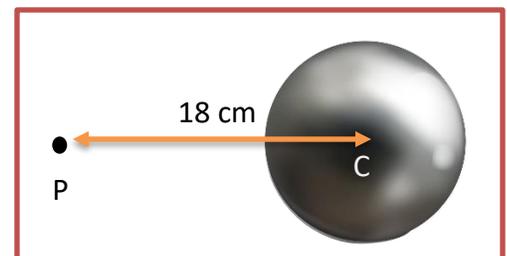
10- What is the electric potential at the center of a metal ring with 12 cm radius and $22 \mu\text{C/m}$ charge distribution?

- A. $1.2 \times 10^6 \text{ V}$
- B. $3.4 \times 10^6 \text{ V}$
- C. $4.8 \times 10^6 \text{ V}$
- D. $5.1 \times 10^6 \text{ V}$



11- What is the charge distribution of the conducting sphere 7.0 cm radius shown in the figure, if the electric potential difference between point (p) = 18 cm from the center and the center of the sphere is: $(V_c - V_p = +12 \text{ V})$?

- A. 4.8 nC/m^2
- B. 2.5 nC/m^2
- C. 1.5 nC/m^2
- D. 9.9 nC/m^2



12- Two point charges $q_1 = +3.0\mu\text{C}$ located at point H (3,0) m, $q_2 = -1.0\mu\text{C}$ located at point M (0,4) m, what is the electric potential at point A (3,4)?

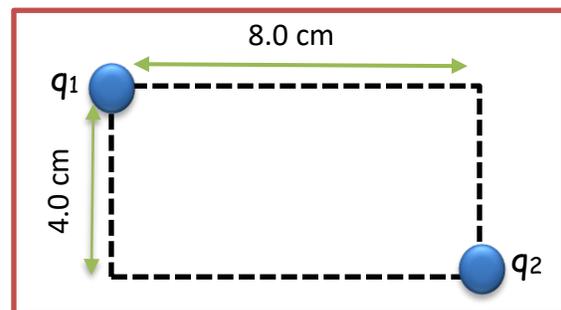
- A. $3.7 \times 10^3 \text{ V}$
- B. $5.2 \times 10^3 \text{ V}$
- C. $7.4 \times 10^3 \text{ V}$
- D. $9.7 \times 10^3 \text{ V}$

13- A conducting sphere of 12 cm radius, and a charge of -5.0 nC , what is the electric potential at point 10 cm from the center?

- A. -370 V
- B. -410 V
- C. -530 V
- D. -610 V

14- What is the electric potential energy of the point charges system shown in the figure, $q_1 = +8.0\mu\text{C}$, $q_2 = +5.0\mu\text{C}$?

- A. 6.8 J
- B. 5.9 J
- C. 5.1 J
- D. 4.0 J



15- A solid conducting sphere with radius of 6.0 cm and charge of $2.0\mu\text{C}$, and another neutral conducting solid sphere with radius of 2.4 cm far away from the first sphere, the two spheres are momentarily connected with a wire, which is then removed, what is the charge on the second sphere?

- A. $0.46\mu\text{C}$
- B. $0.57\mu\text{C}$
- C. $0.61\mu\text{C}$
- D. $0.72\mu\text{C}$